CHAPTER 8
TRANSMISSION SERVICE

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TORQUE SPECIFICATIONS

Transmission Case Bolts	12 ft. lbs. (16.6 Nm)
Bell Crank Nut	12 ft. lbs. (16.6 Nm)
Transmission Drain Plug	14 ft. lbs. (19.3 Nm)
Speedometer Angle Drive	11 ft. lbs. (1.52 kg-m)
Transmission Mounting Bolts	25 ft. lbs. (34.5 Nm)
Drive Sprocket Bolt	17 ft. lbs. (23.5 Nm)
Output Shaft Bearing Mounting Nuts	12 ft. lbs. (16.6 Nm)
Swing Arm Pivot Bolts	55 ft. lbs. (7.59 kg-m)

LUBRICATION

Refer to maintenance section for transmission lubricant type and capacity.

GEAR SHIFT SELECTOR REMOVAL

NOTE: The *shift selector switch* can be replaced with the shift selector box remaining in the frame. To change fluid, remove selector box assembly, disassemble, clean, and assemble.

1. Remove parts that interfere with access to shift selector (seat, right side panel, and exhaust heat shield, etc.).
2. Disconnect wiring harness noting the location and routing of the wires.
3. Pull wiring harness through to gear shift selector side of machine.
4. Disconnect the two linkage rods from gear shift selector slides.
5. Remove three bolts attaching gear shift selector to the mounting bracket.
6. Lift gear selector out of mounting bracket and away from frame.

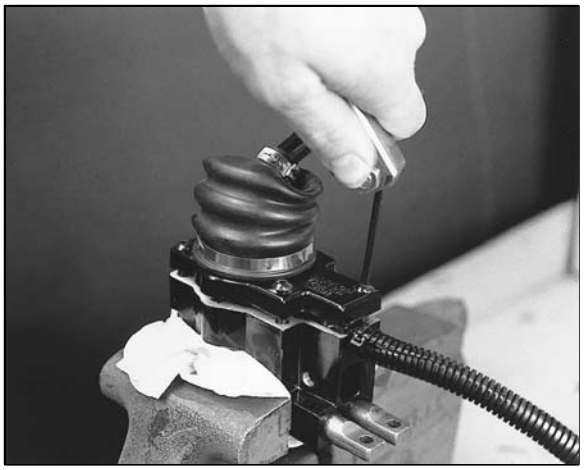
GEAR SHIFT SELECTOR DISASSEMBLY

CAUTION:

Wear eye protection during this procedure. Read each step completely before proceeding. Essential parts may be lost or damaged if you do not heed this caution!

1. Clamp gear selector body lightly in a soft jawed vice. Using a criss-cross pattern, loosen each of the five screws holding the gear shift selector cover to the gear shift selector body. Loosen each screw only a few turns, then proceed to another screw.

NOTE: These parts are under pressure from the internal spring.

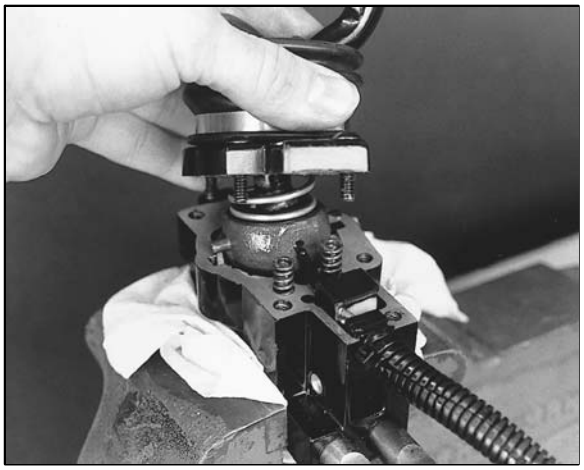


GEAR SHIFT SELECTOR DISASSEMBLY, CONT.

2. Carefully pull the gear shift selector cover and rod from the gear shift selector body.

CAUTION: *Be very careful* to pull the cover away vertically and slowly to avoid damage to the internal gear selector switch. The selector switch is easily damaged.

3. Set the cover/rod assembly aside.
4. *Very carefully* remove the gear shift selector switch from gear shift selector body.
5. Remove the white plastic bearing cup and three springs from gear shift selector.
6. Slowly tilt gear shift selector body sideways to drain oil.

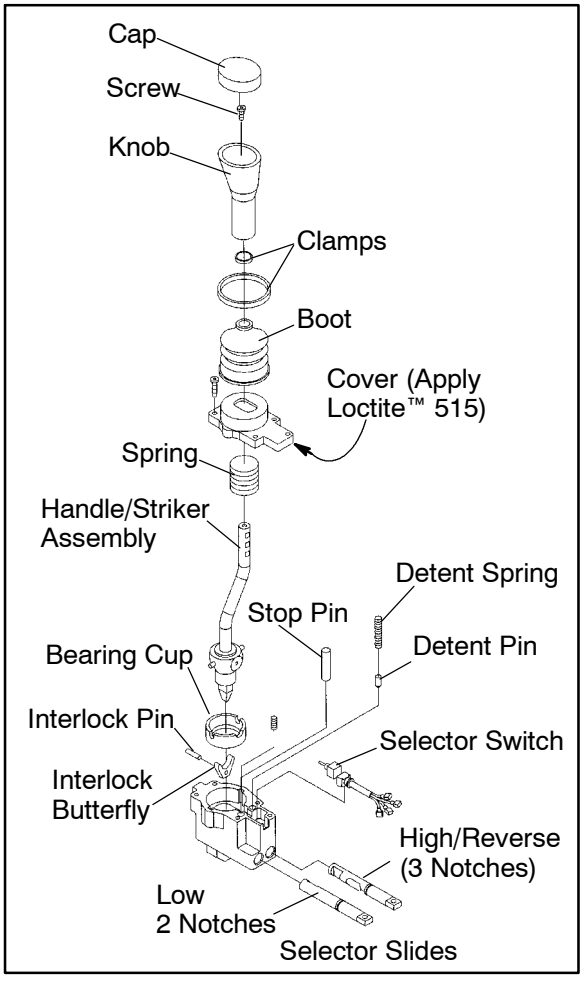


NOTE: *Do not* tip gear shift selector body upside down or detent bullets and stop pin may fall out. Check for signs of moisture in the selector body. Inspect shift boot closely if moisture is present in selector box.

7. Tap gear shift selector body, top down, against a hard, smooth, flat surface to jar the stop pin and two detent bullets loose. Pull the detent bullets and the stop pin out of the gear shift selector body.
8. Hold the interlock butterfly out of the way and remove the two slides, one at a time.
9. Remove interlock butterfly and inspect for wear or damage.

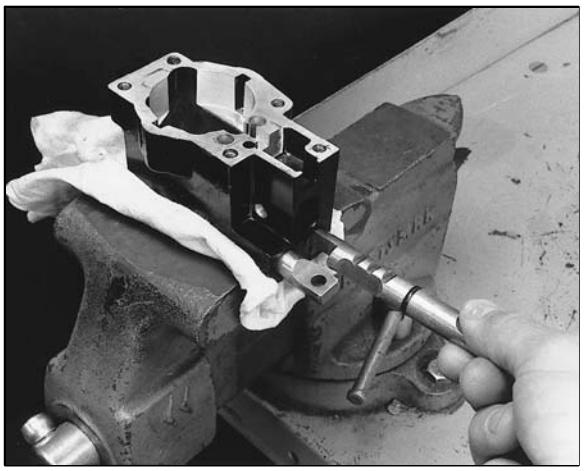
NOTE: The LH slide has two notches and the RH slide has three. The slides must be replaced in the proper channels.

10. Inspect O-rings for damage. Replace if any damage is found.
11. Flush housing with parts washer fluid or penetrating oil to remove all moisture.
12. Dry all gear shift selector parts and remove any corrosion with a wire brush.



GEAR SHIFT SELECTOR ASSEMBLY

1. Install interlock butterfly.
2. Insert slides into gear shift selector body, taking care not to cut or tear O-rings in the process.



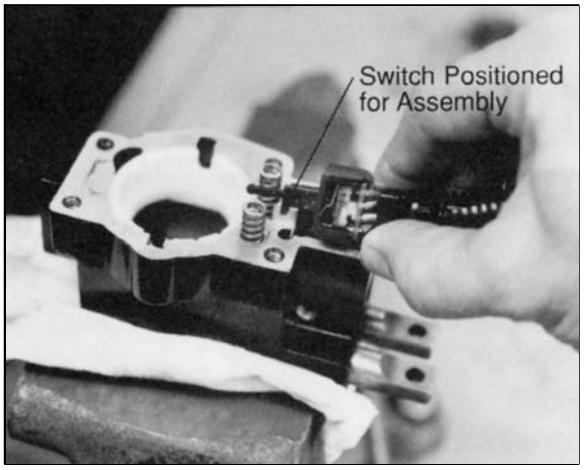
NOTE: The LH slide has two notches and the RH side has three. The slides must be replaced in the proper channels for the shifter to function properly.

3. Replace detent bullets, stop pin, springs and white plastic bearing cup by reversing steps 5 - 7 of Gear Shift Selector Disassembly.
4. Clamp gear shift selector body lightly in a soft jawed vise.
5. Fill selector body with Polaris 0W-40 All Season Synthetic motor oil. The oil level should be at one half the height of the slides (approx. 1 oz.).

Gear Shift Selector Capacity: 1 oz.

Polaris 0W-40 All Season Synthetic Oil
PN 2871281 - Quart
PN 2871844 - Gallon

CAUTION: Too much oil could cause the selector to hydrolock. Be sure the selector box is level when adding oil.

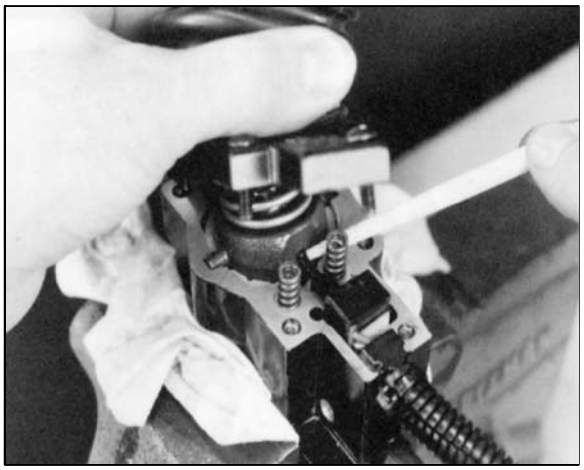


6. Carefully reinstall the gear shift selector switch. The hook on the switch faces downward toward shift slides. This hook catches on the selector body to prevent the switch from moving out of place.

NOTE: Switch must be positioned properly or AWD may not function.

7. Wipe gear selector dry, clean surfaces of cover and selector box with Loctite™ Primer T and place a bead of Loctite™ 518 Gasket Eliminator or 3 Bond 1215 completely around the edge of the gear shift selector body.

8. *Carefully* reattach cover/rod assembly to gear shift selector body. Make sure slides are in neutral, or butterfly may be damaged.



CAUTION: Be very careful not to damage the selector switch while assembling these parts. Tab end of selector switch must be positioned in hole of striker as shown at right. If not, assembling cover will damage switch. Torque cover screws to 12 ft. lbs. (1.7 kg-m).

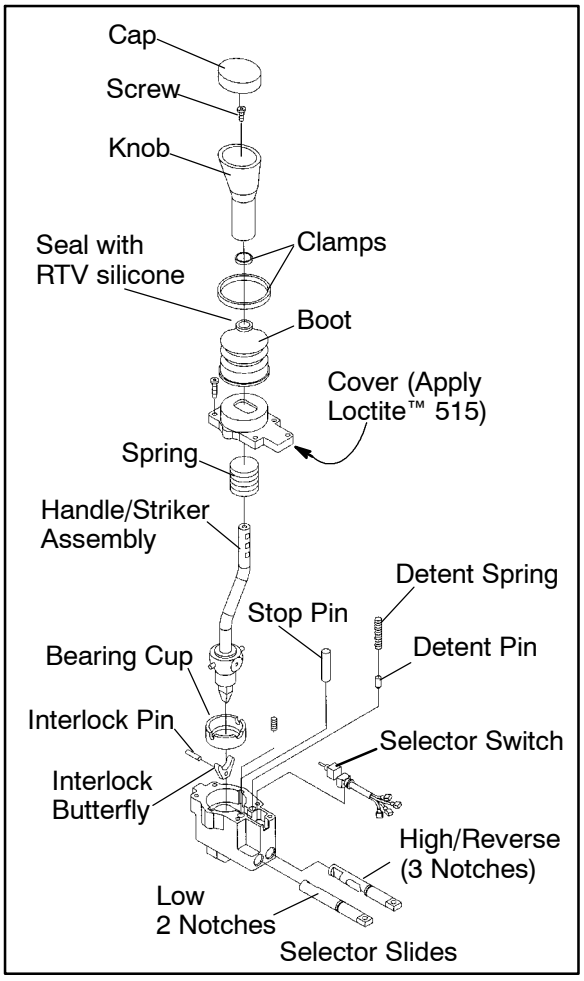
GEAR SHIFT SELECTOR INSTALLATION

1. Place gear shift selector back into the mounting bracket and replace three bolts.
2. Reconnect linkage rods to gear shift selector slides. Adjust as required. See linkage adjustment procedures.
3. Route gear shift selector switch wiring harness properly and secure in place with cable ties.
4. Reconnect the wiring harness leads.
5. Secure the gear shift selector switch wiring harness to the frame.
6. Replace remaining parts.

BOOT REPLACEMENT

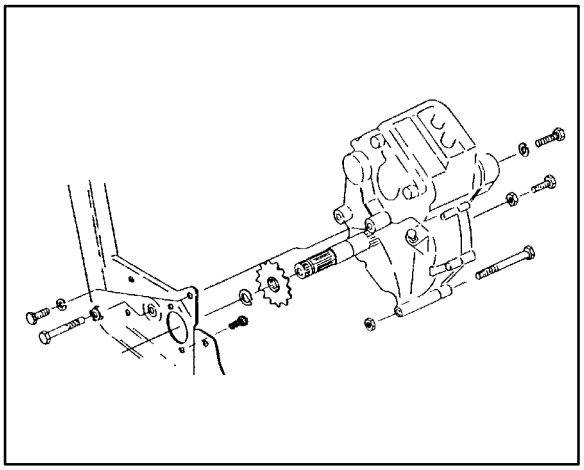
NOTE: If moisture is found in the gear shift selector the boot should be replaced.

1. Using a slotted screwdriver, remove cap from gear shift knob.
2. Remove torx screw securing knob to selector rod.
3. Pull selector knob off selector rod.
4. Remove band clamps on rubber boot.
5. Slide boot off selector rod and replace with a new one.
6. Apply RTV silicone to selector rod to seal top of boot.
7. Place band clamps in position and tighten using CV boot clamp pliers.
8. Replace shift knob, securing it to selector rod with screw removed in step 2.
9. Push shift knob cover back into place. Allow approximately 12 hours for RTV silicone to cure.



TRANSMISSION REMOVAL

1. Remove seat, cab and air box.
2. Remove right side shield.
3. Remove PVT outer cover, both drive and driven clutch, and inner PVT cover (refer to Clutch Chapter 6).
4. Remove rear PVT bracket.
5. Remove carburetor.
6. Remove drive chain and sprocket.
7. Remove mounting bolts as shown.
8. Remove through-bolt from bottom of transmission.
9. Loosen left side swingarm bolt until clear of transmission case.
10. Remove recoil.
11. Remove transmission from right side of frame.

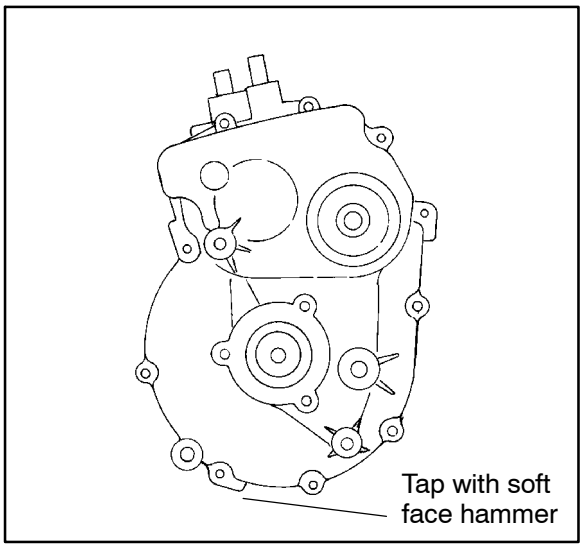


TRANSMISSION DISASSEMBLY

1. Remove speedometer angle drive, sprocket retaining circlip and sprocket.

2. Remove the transmission cover bolts.

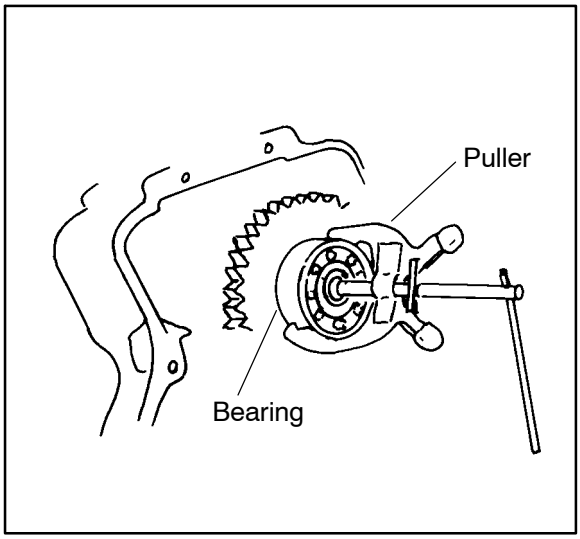
3. With a soft face hammer tap on the cover bosses and carefully remove the cover. See Ill. 1.



Ill. 1

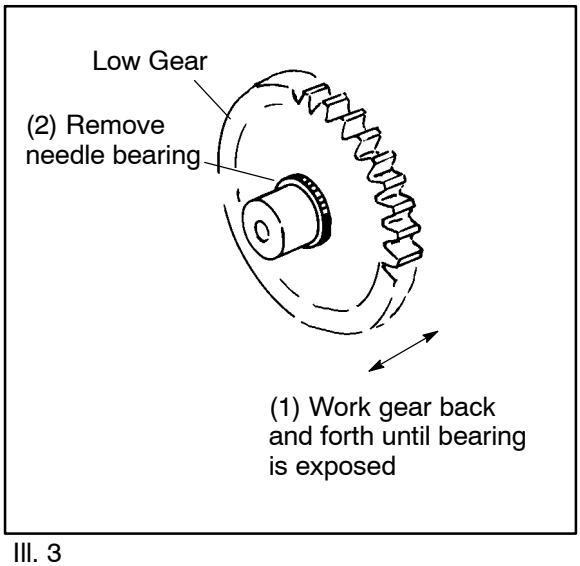
4. Using the battery cable clamp puller, remove the bearing from the sliding gear shaft. See Ill. 2.

5. Remove outer thrust washer.



Ill. 2

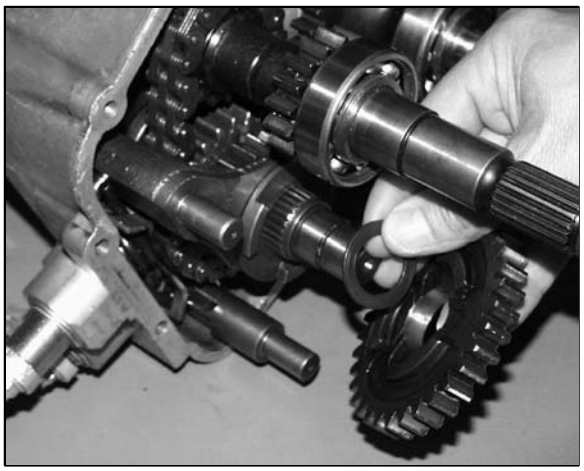
6. To remove the needle bearing from the low gear, tip transmission to point end of shaft downward. Work gear back and forth as shown until bearing is exposed and slide bearing out. See Ill. 3.



Ill. 3

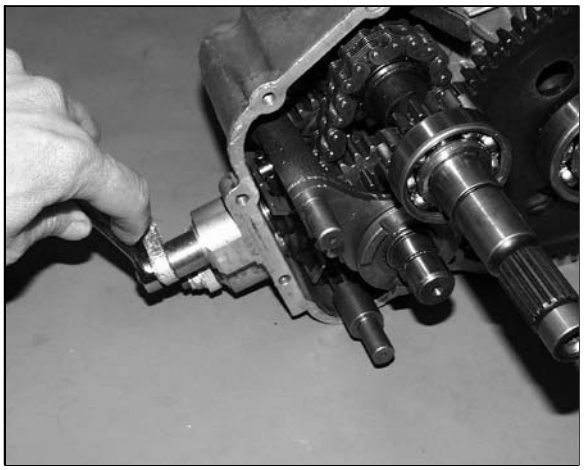
TRANSMISSION DISASSEMBLY, CONT.

7. Remove the low gear and inner thrust washer.

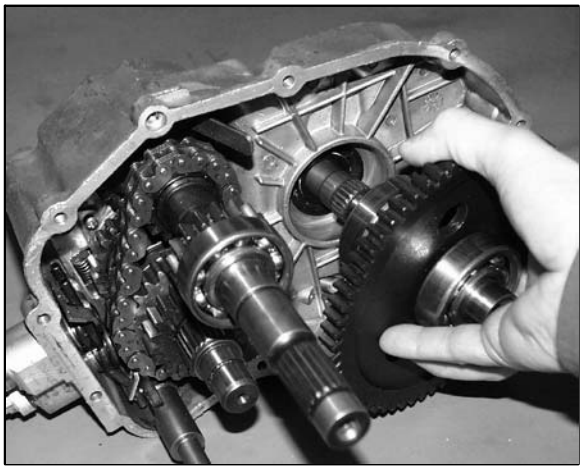


8. Use a 1/2″ wrench on gearshift bell crank retaining nuts to aid in moving the shift fork shaft.
9. Remove the low range shift fork shaft with engagement dog by rotating the low gear shift arm clockwise and pulling outward on shift fork shaft.

NOTE: High/Reverse bell crank must be in neutral to remove Low gear shift fork shaft.



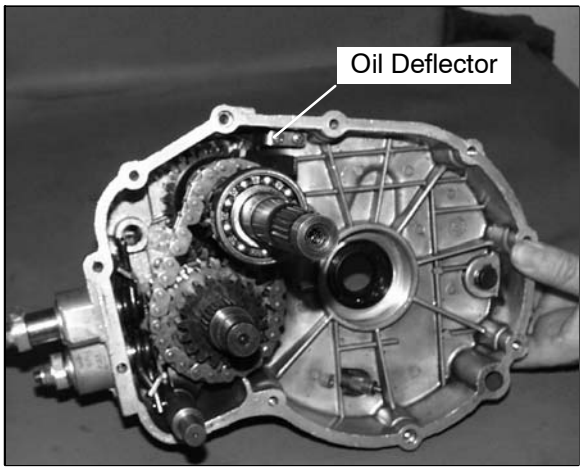
10. Remove output shaft and gear assembly by tapping on shaft with a soft faced hammer, from the back side of the gear case assembly.

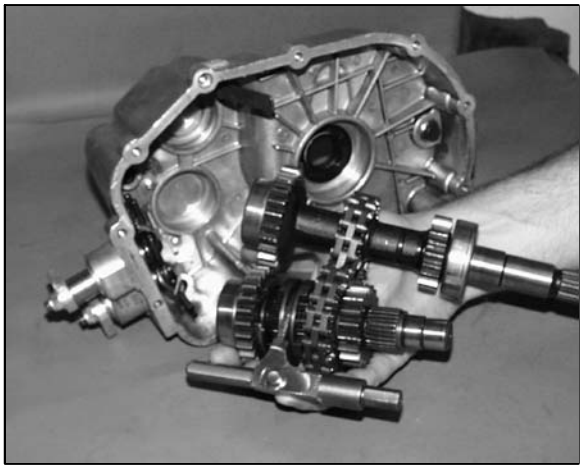


TRANSMISSION DISASSEMBLY, CONT.

11. Remove sliding gear shaft with high/reverse shift shaft and input shaft as an assembly by gradually pulling assemblies from their bearing mounts while rotating the high/reverse shift arm counterclockwise.

NOTE: Make sure input shaft gear clears oil deflector, but do not remove the oil deflector.





12. Clean all components in a parts washer and inspect for wear.

13. Inspect engagement dogs of gears and replace if edges are rounded.

14. Inspect gear teeth for wear, cracks, chips or broken teeth.

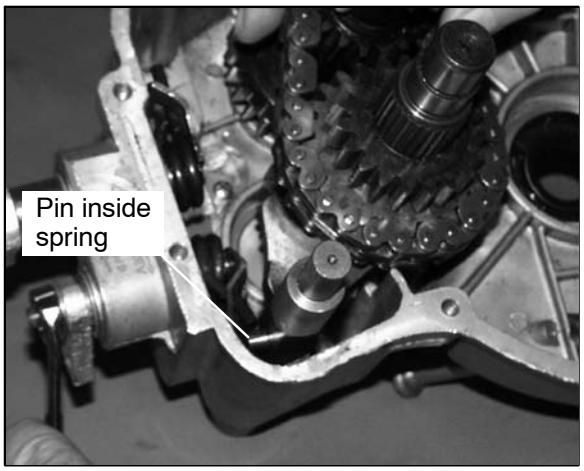
15. Remove seals from transmission case.

NOTE: New seals should be installed after the transmission is completely assembled.

16. Inspect bearings for smooth operation. Check for excessive play between inner and outer race.

TRANSMISSION ASSEMBLY

1. Carefully install high/reverse shaft assembly and gear cluster as a unit into their respective bearing case areas. Make sure input shaft clears oil deflector. Tap with a soft face hammer to seat shaft assemblies.



NOTE: Make sure high/reverse shift shaft pin is properly positioned within legs of shift fork shaft return spring.

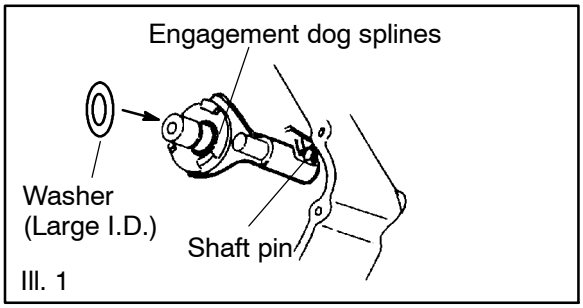
2. Seat the shafts and shift the assembly into neutral position.

NOTE: After installation, the High / Reverse shift arm must be placed in the neutral position to complete reassembly.

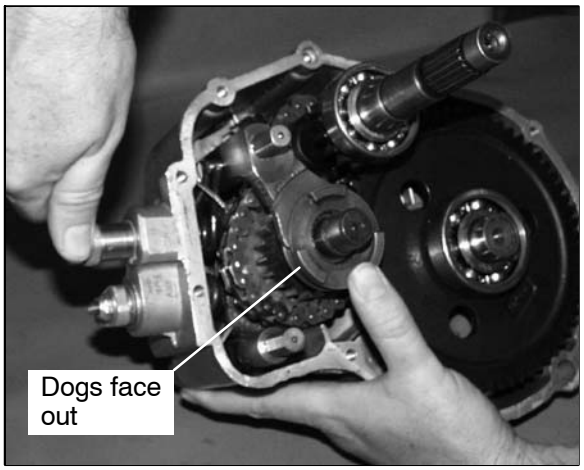
3. Install the output shaft and gear assembly into the gear case.
4. Install engagement dog on low range shift shaft.

NOTE: Dogs should face toward the mating gear.

5. Install low shift shaft assembly, aligning pin on shift shaft between ends of return spring, the engagement dog splines with the sliding gear shaft splines, and the end of shift shaft to the gearcase.
See Ill. 1.



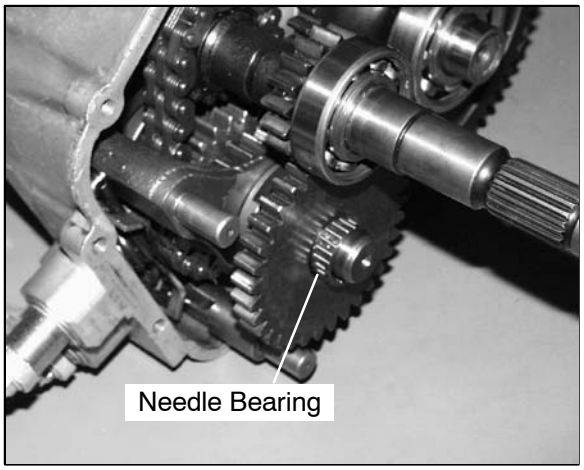
Ill. 1



6. Install *large* I.D. washer on shaft (against splines).

TRANSMISSION ASSEMBLY, CONT.

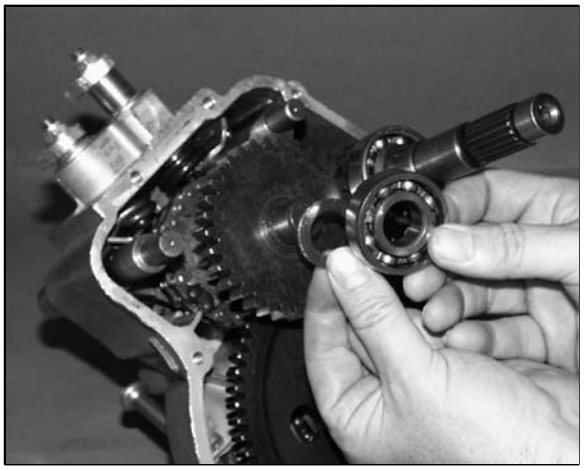
7. Install low gear on shaft with engagement dogs inward.
8. Lubricate and install needle bearing into gear.



9. Install smaller I.D. washer and then ball bearing.

NOTE: The bearing should be flush with the shaft when seated correctly.

10. Prior to reinstalling the cover make sure the mating cover surfaces are clean and dry. Apply Loctite™ 518 or 3-Bond 1215 to mating surfaces.
11. Reinstall cover and torque bolts in 3 steps to 12 ft. lbs. (17 Nm) using a criss-cross pattern.
12. Install transmission and add 20 oz. of Polaris Premium Synthetic Gear Case Lubricant.



Transmission Capacity: 20 Oz.

Premium Synthetic Gear Case Lubricant
PN 2871178 (12 oz.)
PN 2870464 (Gallon)

TRANSMISSION INSTALLATION

1. Install transmission from right side of ATV with output shaft side down and input shaft side up toward right rear corner of frame.

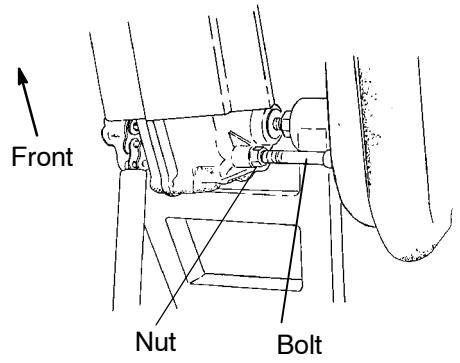
NOTE: As you are guiding the output shaft into its mounting, the rear drive chain can be installed onto shaft and sprocket. Make sure chain is properly positioned on axle sprocket.

2. Loosely install lower mounting bolt and nut.

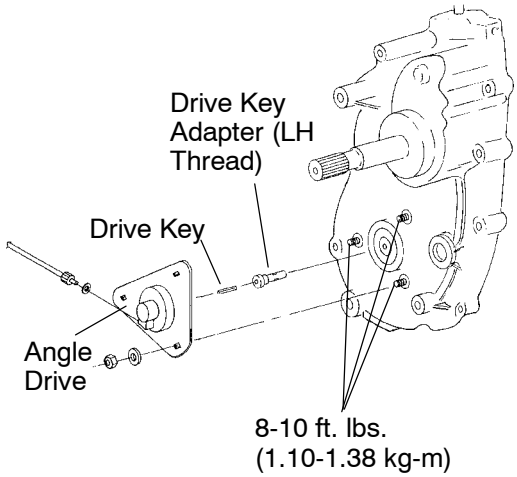
CAUTION:

Be sure bolts are proper length or transmission damage may occur.

3. Loosely install right side **3/8-16 x 3/4″** mounting bolt in top right hole.
4. Attach washer, nut and roller chain guide to the right side swing arm bolt.
5. Align transmission case bushing with bolt and torque nut to 55 ft. lbs. (76 Nm). Bend the tab washer to lock the bolt in place.
6. Loosely install left side **3/8-16 x 3/4″** top mounting bolt.
7. Install washer and nut on the left side swing arm bolt.
8. Align transmission case bushing with bolt and torque nut to 55 ft. lbs. (76 Nm). Bend the tab washer to lock the bolt in place.
9. Align transmission with engine (See Clutch Section for center distance and alignment procedure. Torque lower mounting bolt to 25 ft. lbs. (35 Nm). Torque right and left 3/8-16 x 3/4″ bolts to 25 ft. lbs. (35 Nm).
10. Adjust torque stop by adjusting bolt until it contacts the frame. Then tighten an additional one half turn using a wrench. Hold the adjuster bolt and tighten the jam nut.
11. Attach speedometer cable to angle drive and tighten.
12. Install skid plate and torque bolts to 5 ft. lbs. (7 Nm).
13. Install driven clutch spacer and dust seal(s).
14. Install inner cover and all PVT system components. Refer to PVT Section for procedure.



Transmission Torque Stop Adjustment



TRANSMISSION INSTALLATION, CONT.

15. Grease support bearing and install on output shaft.

Swing Arm Bolt Torque:
55 ft. lbs. (76 Nm)

Transmission Mounting Bolt Torque:
25 ft. lbs. (35 Nm)

Skid Plate Bolt Torque:
5 ft. lbs. (7 Nm)

Inner Cover Bolt Torque:
12 ft. lbs. (17 Nm)

Drive Clutch Torque:
40 ft. lbs. (5.5 Nm)

Driven Clutch Torque:
12 ft. lbs. (17 Nm)

16. Slide output shaft support bearing inward against frame. Be sure to hold bearing square with shaft.
17. Visually inspect gap between frame and upper or lower mounting boss on support bearing. If a gap exists on upper or lower boss, measure with a feeler gauge and add shim(s) as required to maintain proper alignment when mounting nuts are tightened. Torque to specification.

Mounting Nut Torque:
18 ft. lbs. (25 Nm)

Shim Kit PN 2200126 includes:
(2) 5210764 .020″
(2) 5210759 .063″
(2) 5210760 .080″

18. Apply silicone to splines of brake disk and reinstall disk.
19. Install brake caliper on disk and bolt to frame with the rear caliper shield. Torque to specification.

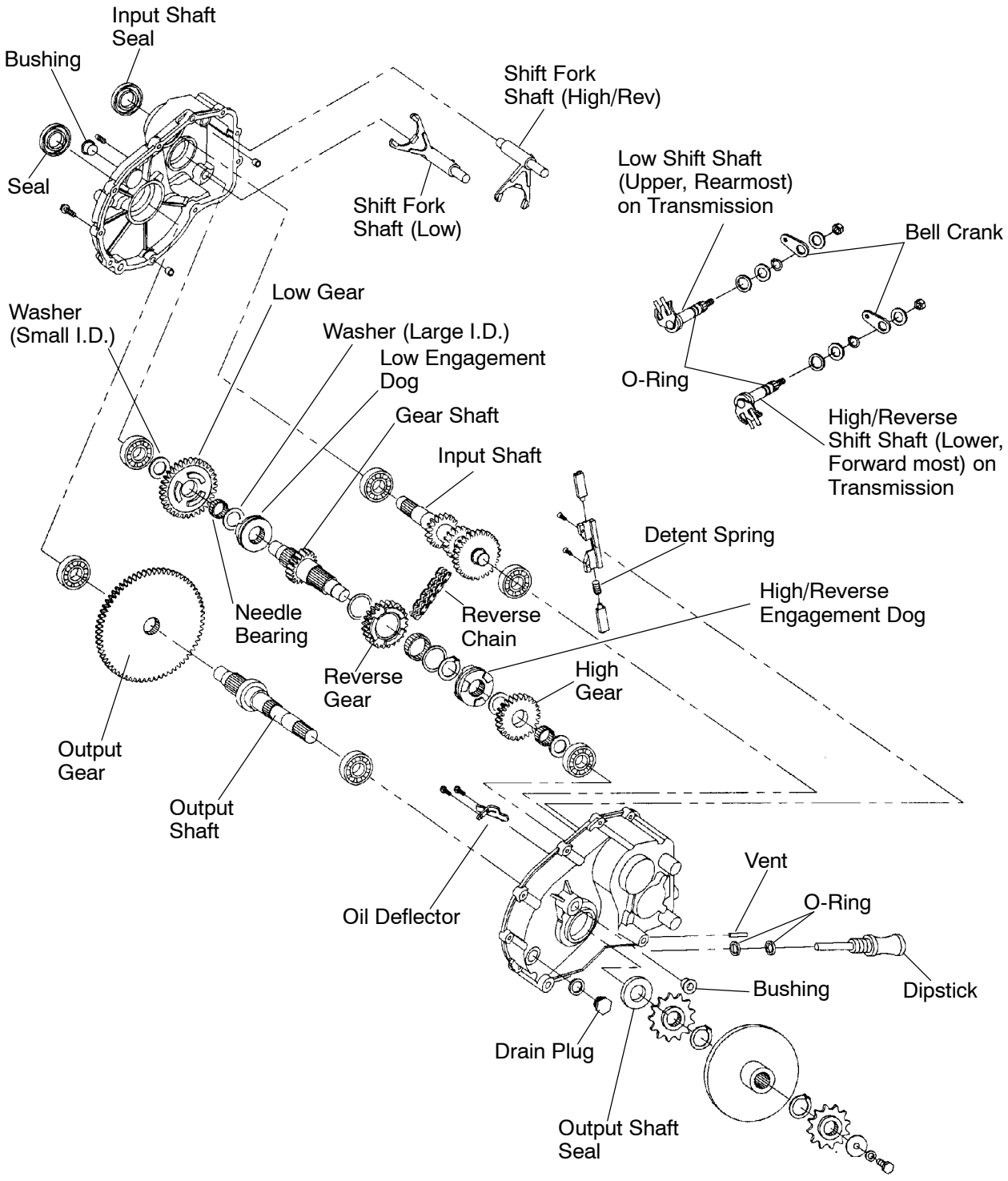
Caliper Attaching Bolt Torque:
12 ft. lbs. (17 Nm)

TRANSMISSION INSTALLATION, CONT.

20. Install snap ring onto output shaft securing brake disk.
21. Install sprockets and middle chain. Install sprocket with bolt, lock washer and retaining washer and torque output shaft sprocket bolt to 17 ft. lbs. (23 Nm). Torque center eccentric sprocket bolt to 30 ft. lbs. (41 Nm). Install chain guard with spacer. Adjust rear and center chains. Refer to Maintenance Section for details.
22. Install brake disk cover.
23. Install top mounting bolts of brake disk cover, rear caliper shield and caliper to frame. Torque caliper mounting bolts to 12 ft. lbs. (17 Nm).
24. Attach brake caliper arm to moveable cam and adjust foot pedal to 1/2″ deflection. (See Maintenance Section) Lock the jam nut.
25. Install air cleaner assembly, making sure carb boot seals on air box correctly. Tighten hose clamp.
26. Reinstall pre-cleaner duct work and pre-cleaner.
27. Proceed with linkage rod adjustment found in the Maintenance Chapter 2.

Output Shaft Bearing Retaining Bolt Torque:
17 ft. lbs. (23 Nm)
Brake Caliper Attaching Bolt Torque:
12 ft. lbs. (17 Nm)
Output Shaft Sprocket Bolt Torque:
17 ft. lbs. (23 Nm)
Center Eccentric Sprocket Bolt Torque:
30 ft. lbs. (41 Nm)

TRANSMISSION EXPLODED VIEW



TROUBLESHOOTING CHECKLIST

Check the following items when shifting difficulty is encountered.

- Idle speed adjustment
- Transmission oil type/quality
- Transmission torque stop adjustment
- Engine torque stop adjustment
- Drive belt deflection
- Loose fasteners on rod ends
- Loose fasteners on shifter
- Worn rod ends, clevis pins, or pivot arm bushings
- Linkage rod adjustment and rod end positioning
- *Worn, broken or damaged internal transmission components

***NOTE:** To determine if shifting difficulty or problem is caused by an internal transmission problem, isolate the transmission by disconnecting linkage rods from transmission bellcranks. Manually select each gear range at the transmission bellcrank, and test ride vehicle. If it functions properly, the problem is outside the transmission.

If transmission problem remains, disassemble transmission and inspect all gear dogs for wear (rounding), damage. Inspect all bearings for wear.